SONY®

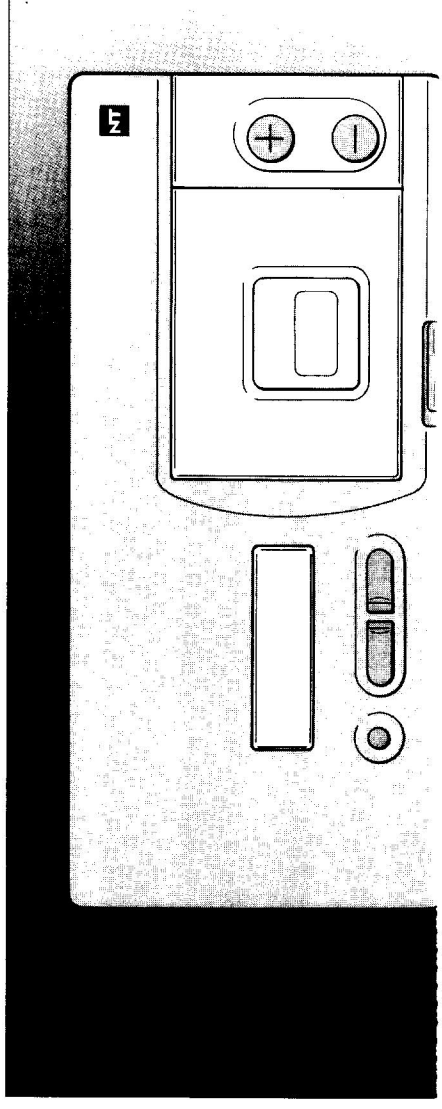
3-754-267-21

Digital Micro Recorder

NT-1

Operating Instructions

Before operating the unit, please read this manual thoroughly and retain it for future reference.



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Features

- **Digital stereo tape recorder**
  The non-tracking format of playback makes this compact size possible. Furthermore, high-fidelity digital sound is available with simple operations.
- **Stamp-size cassette tape**
  The tiny NT (Non-Tracking) cassette tape is capable of up to 120 minutes of playback/recording.
- **Runs on one size AA (R6) battery**
  One alkaline battery provides power for about 7 hours of continuous recording or about 6 hours of continuous playback.
- **Auto Gain Control (AGC)**
  The digital AGC adjusts the recording level automatically and helps prevent recording mistakes. (The recording level can also be adjusted manually.)
- **Clock with auto calendar function**
  The built-in clock/calendar records the date and time at the beginning of any recording. When you play back a recording, you can see when it was made. The calendar records the date up to the year 2099.

Table of Contents

Supplied Accessories 3
What is the NT (Non-Tracking) Format ? 4
Parts Identification 6
Display 8
Power Sources 9
Setting the Date and Time 12
Recording 14
Listening to a Tape 21
Cautions 24
Maintenance 25
Specifications 26
Troubleshooting Guide . . . . . Back cover

Warning

To prevent fire or shock hazard, do not expose the set to rain or moisture.
To avoid electrical shock, do not open the cabinet.
Refer servicing to qualified personnel only.

Information to user
You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

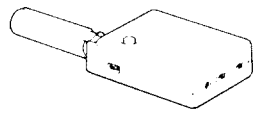
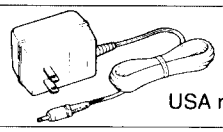
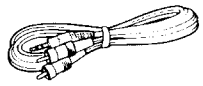
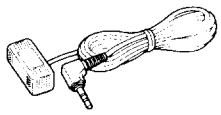
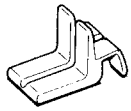
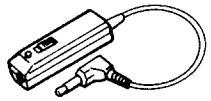
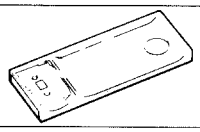
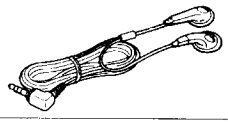
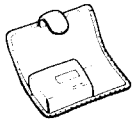
Owner's Record
The serial number is located inside the cassette holder. Record the serial number in the space provided below. Refer to them whenever you call upon your Sony dealer regarding this product.

Model No. NT-1 Serial No. _____

INFORMATION (USA model)
This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Supplied Accessories

Adaptor unit Connect to the main unit when using the supplied AC adaptor or connecting cord.	
Lithium battery (CR1220) Use to operate the built-in clock/calendar.	
AC power adaptor Use when operating the unit on an external power source.	 USA model
Connecting cord Use when connecting with other equipment.	
Stereo microphone Use when recording a meeting, etc.	
Microphone stand Use to support the supplied microphone.	
Microphone attenuator Use when the sound is distorted while recording with microphone.	
NT cassette tape (NTC-90) Offers 90 minutes of recording and playback on both sides.	
Stereo headphones Less sound leakage than previous headphones.	
Carrying case Use when carrying the unit.	

What is the NT (Non-Tracking) Format ?

The NT format is the newly developed digital audio tape format which employs stamp-size cassette tapes, and is intended as one of the next generation tape recorders.

The major benefits of this NT format are:

- Pocketable size
- Digital Hi-Fi stereo sound
- Long battery life with one size AA (R6) battery
- Easy operation

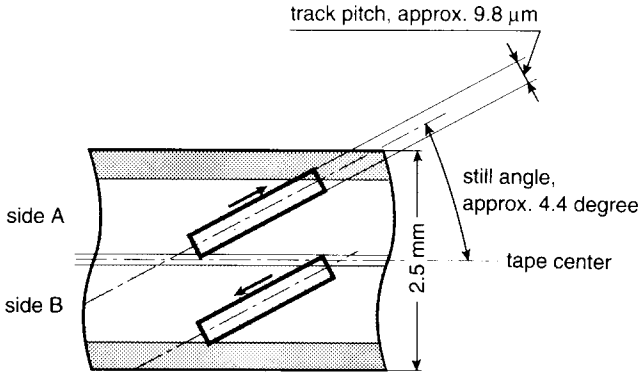
The following is a brief explanation of the NT format:

Pocketable Size

The size of the NT cassette has made possible a tape recorder small enough to keep in your pocket. Storing cassette tapes is no longer a problem either.

Furthermore, you can obtain digital quality recording and playback of up to 2 hours with the soon-to-be sold NTC-120 cassette.

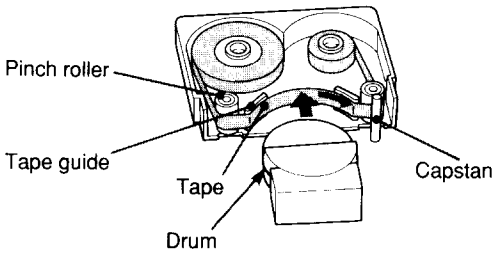
Tape pattern



Non-Loading Method

With the conventional helical scan system, it was necessary to have a loading mechanism that drew out the tape from the cassette and wrapped it around the rotary drum. This loading mechanism increased the complexity of the mechanism.
However, with the Non-Loading method, plastic tape guides molded to fit the rotary drum make a loading mechanism unnecessary. Instead, the rotary drum is just pressed against the tape guides and the tape wraps around the drum automatically.

Non-loading method

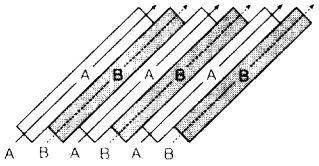


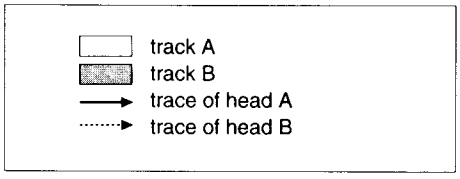
How Can the NT Cassette Tape Be So Small ?

With the conventional helical scan system of tape tracking, during playback, the rotary heads must precisely trace each recorded track of the tape. This tracking method requires highly precise mechanical components, which made it difficult to reduce the size of the system. However, with the NT (Non-Tracking) format, the rotary heads are not required to precisely trace the recorded tracks during playback.

How the tape heads function in a conventional system

Traces along the recorded track



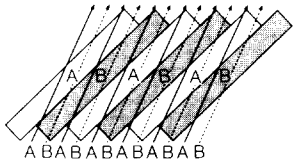


Instead of tracing each track accurately, the rotary heads turn at a higher speed (twice as fast as that for recording) and reads more data. The data picked up may be disconnected or fragmented; however, the IC memory rearranges and augments the data and faithfully reproduces the original sound. Therefore, with this system, the number of mechanical parts could be reduced.

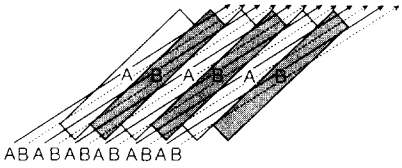
How the tape heads function in the NT format system

Traces at double the density compared to that for recording

a. When the playback head traces at an angle more obtuse than that during recording

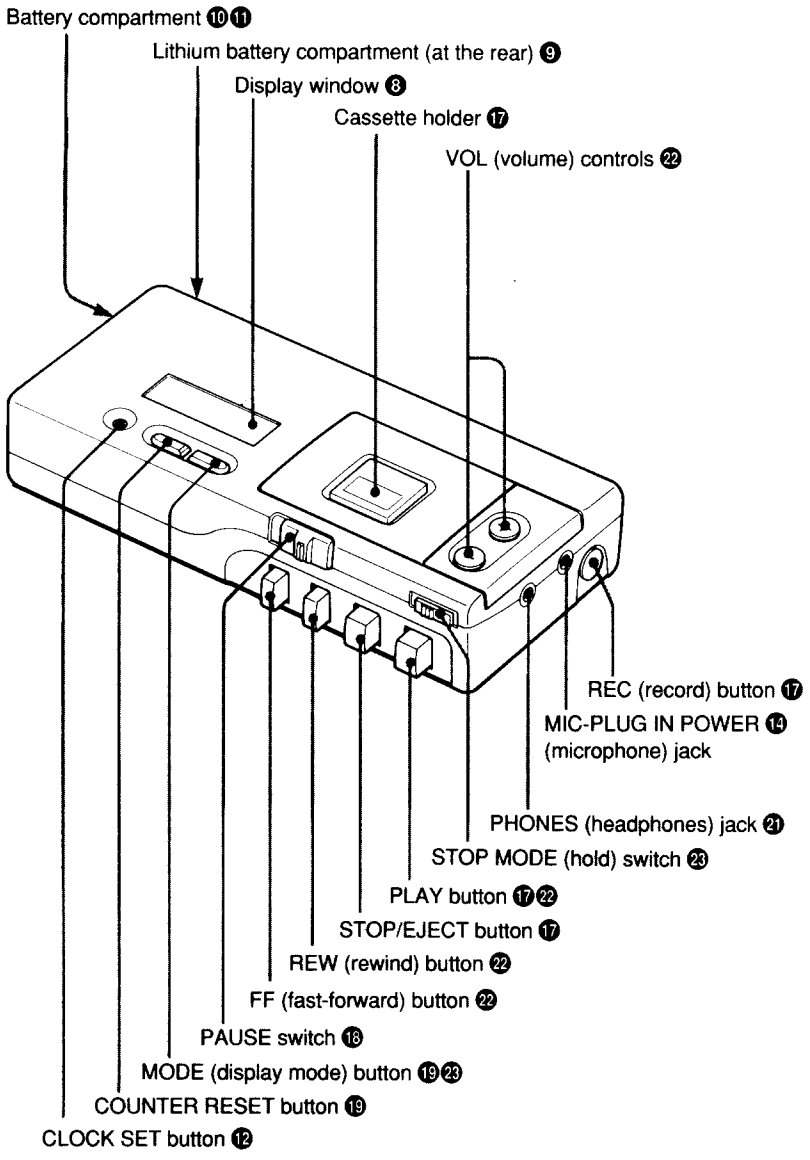


b. When the playback head traces at an angle more acute than that during recording

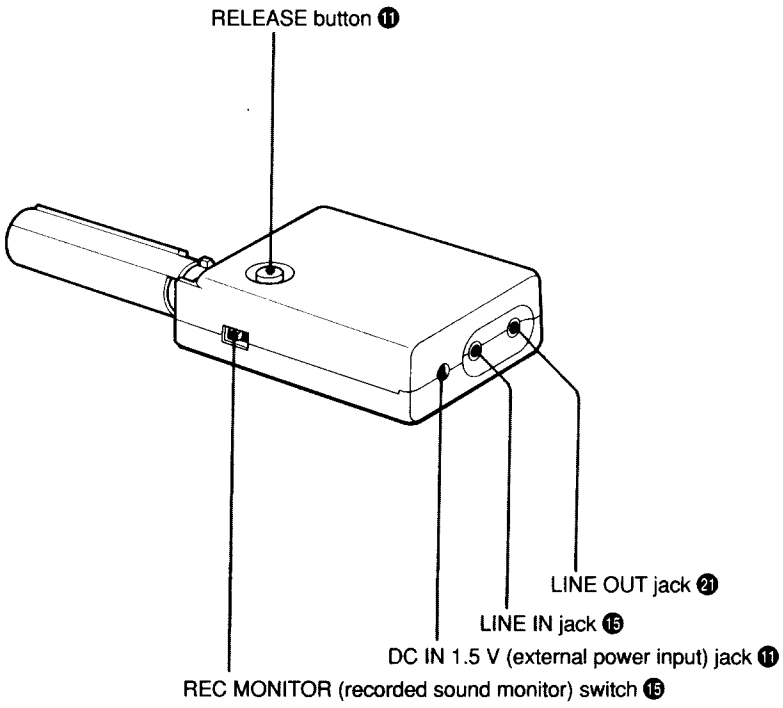


During playback, A → B and B → A intervals need not be the same.

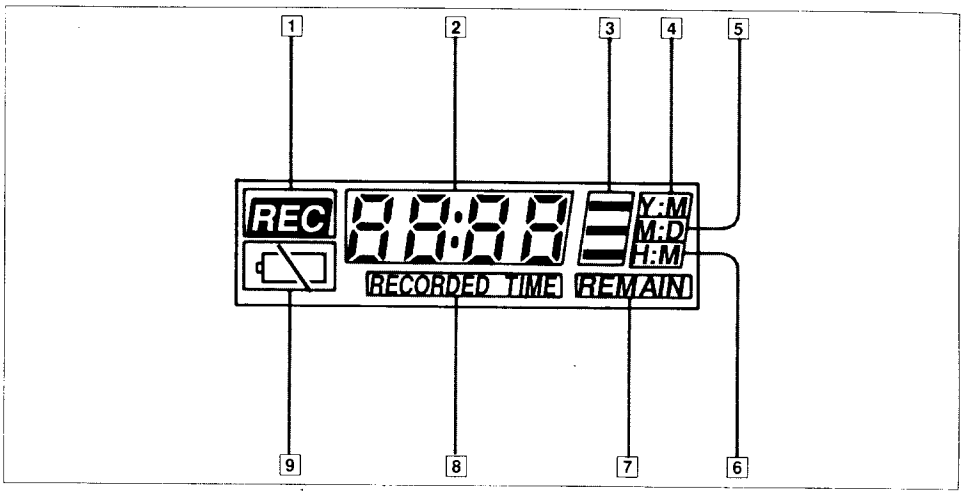
Main Unit


Battery compartment ⑩⑪
Lithium battery compartment (at the rear) ⑨
Display window ⑧
Cassette holder ⑰
VOL (volume) controls ㉒
REC (record) button ⑰
MIC-PLUG IN POWER ⑭
(microphone) jack
PHONES (headphones) jack ㉑
STOP MODE (hold) switch ㉓
PLAY button ⑰㉒
STOP/EJECT button ⑰
REW (rewind) button ㉒
FF (fast-forward) button ㉒
PAUSE switch ⑱
MODE (display mode) button ⑲㉓
COUNTER RESET button ⑲
CLOCK SET button ⑫

Adaptor Unit


RELEASE button ⓫
LINE OUT jack ㉑
LINE IN jack ⓯
DC IN 1.5 V (external power input) jack ⓫
REC MONITOR (recorded sound monitor) switch ⓯

Display For further information, see pages indicated in ●.



1 **REC (Recording) indicator ⑰**
Flashes when the REC button is pressed and lights during recording.

2 **Counter ⑲㉒㉓**
Displays the tape counter, remaining time to the end of the tape, the current time and date, and the time and date the recording was made. Each time the MODE button is pressed, the display mode changes.
Also displays the side now being played (either A or B) or recorded and the volume when the VOL + or - button is pressed.

3 **Bar indicator ⑫⑳**
Indicates which time/date combination is now displayed: Y:M (Year:Month), M:D (Month:Day), or H:M (Hour:Minute). Also indicates the sound level of recording or playback while the tape counter is displayed.

4 **Y:M (Year:Month) indicator ⑫⑲㉓**
Indicates that the year and month is displayed when the bar lights on the left of this indicator.

5 **M:D (Month:Day) indicator ⑫⑲㉓**
Indicates that the month and day is displayed when the bar lights on the left of this indicator.

6 **H:M (Hour:Minute) indicator ⑫⑲㉓**
Indicates that the month and day is displayed when the bar lights on the left of this indicator.

7 **REMAIN indicator ⑲㉓**
Indicates that the remaining time to the end of the tape is now displayed. Flashes when the remaining play or recording time is less than four minutes.

8 **RECORDED TIME indicator ㉓**
Lights when the time and date the recording was made is displayed.

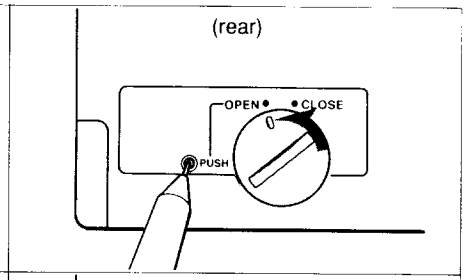
9 **(Low battery) indicator ⑩**
Flashes when the battery becomes weak.

Power Sources

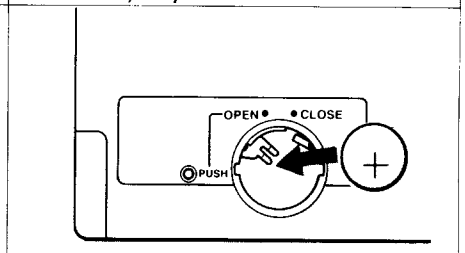
Installing a Lithium Battery

Before using the unit, install the lithium battery to operate the built-in clock/calendar.

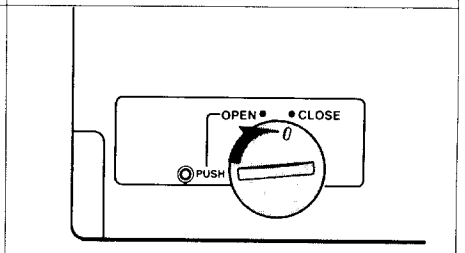
1 Press and hold the button marked "PUSH" at the rear of the unit with a pen tip, and remove the lid by turning it to the OPEN position.



2 Insert a lithium battery with the + side up.



3 Replace the lid and turn it to the CLOSE position.



Lithium battery life

Replace the lithium battery about once a year. When the battery becomes weak, the date and time display may flash, may not keep good time, or may reset itself.
When the battery is not weak, however, there may be an error of about 2 minutes per month.

Cautions on lithium battery

- Keep the lithium battery and the unit out of the reach of children.
- Should the battery be swallowed, immediately consult a doctor.

When replacing the lithium battery

Reset the time and date when you replace the lithium battery. If you use the unit without setting the date and time, the time and date will not be recorded with the recording.

If you cannot open the lid

Turn it back fully to the CLOSE position, then press and hold PUSH and turn it to the OPEN position again.

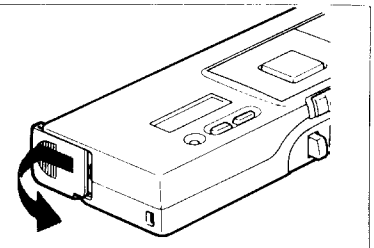
WARNING

Battery may explode if mistreated.
Do not recharge, disassemble or dispose of in fire.

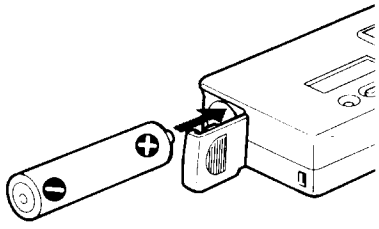
Using the Unit with a Battery

Insert a size AA (R6) battery.

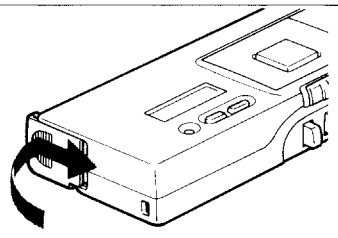
1 Open the battery compartment lid by sliding it in the direction of the OPEN mark.



2 Insert a battery with the + side first.



3 Close the lid and slide it back to the right position.



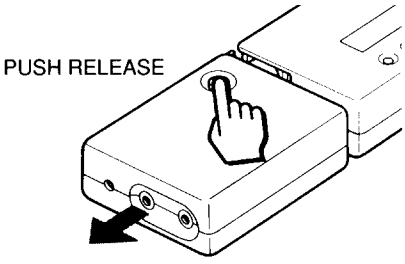
When the battery becomes weak

The ⊏\⊐ indication blinks in the display window. Exchange the battery with a new one, or the tape does not run smoothly and noise will be heard.

If the battery becomes too weak to operate the unit, it will automatically stop.

To release the adaptor unit

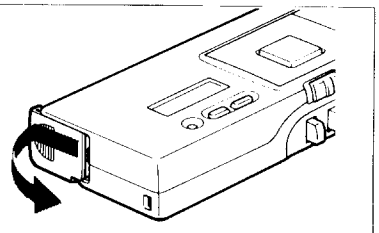
Press and hold the RELEASE button, and pull out the adaptor unit.



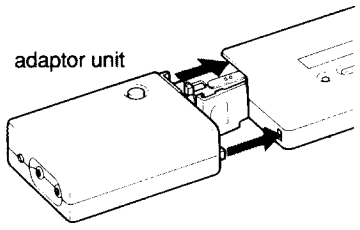
Using the Unit on an External Power Source

Attach the adaptor unit and connect the AC power adaptor.

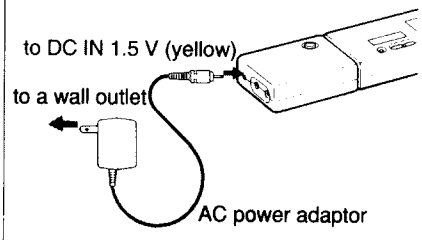
1 Open the battery compartment lid by sliding it in the direction of the OPEN mark.



2 (Remove the battery and) insert the adaptor unit until it clicks.



3 Connect the AC power adaptor to the DC IN 1.5 V jack.



Note on the AC power adaptor

Use only the supplied AC power adaptor. Do not use any other AC power adaptor.

Polarity of the plug

IMPORTANT (UK model)

The wires in this mains lead are coloured in accordance with the following code;

Blue: Neutral

Brown: Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:

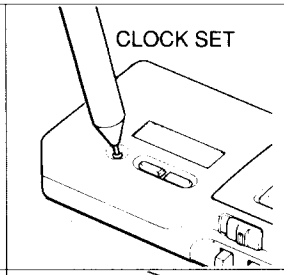
The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured black. The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured red. Do not connect either wire to the earth terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

Setting the Date and Time

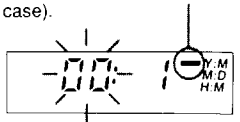
Set the year (Y), month (M), day (D), hour (H), and minute (M) in this order with the unit in the stop mode.

After you have set the clock/calendar, the unit automatically records the date and time whenever you start recording.

1 Press and hold the CLOCK SET button with a pen tip.

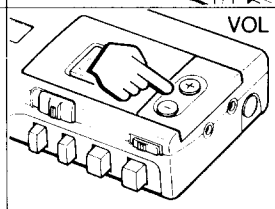


The bar shows what the digits in the display mean. (Year:Month in this case).

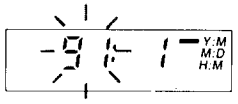


The digits on the left start to flash and indicate that you can set the year.

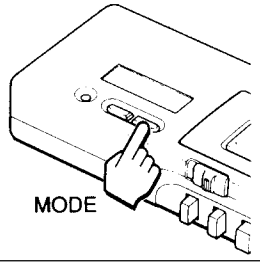
2 Press the VOL + or – button and set the flashing digits to the current year.

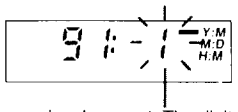


+: The digits increase.
–: The digits decrease.



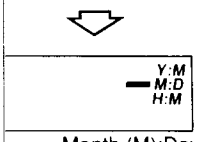
3 Press the MODE button.



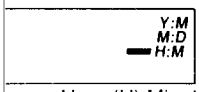


The year has been set. The digits on the right start to flash and indicate that you can set the month.

4 Repeat steps 2 and 3 to set the month, day, hour and minute. As you proceed, the bar moves as illustrated on the right and shows what the digits in the display mean.



Month (M):Day (D)



Hour (H):Minute (M)

When you have registered the minutes, the clock starts operating and the tape counter appears in the display window.

To set the time more precisely

When setting the minutes, press the MODE button as soon as you hear the time signal.

To reset the date and time

Follow the steps below to reset incorrect digits:

1 Press the CLOCK SET button.
2 Keep pressing the MODE button until the digit(s) you want to reset flashes.
3 Press the VOL + or - button to enter the correct digit(s).
4 To reset other digits, repeat steps 2 and 3 before proceeding to step 5. If you have reset all the desired digits, go on to step 5.
5 Press the CLOCK SET button.

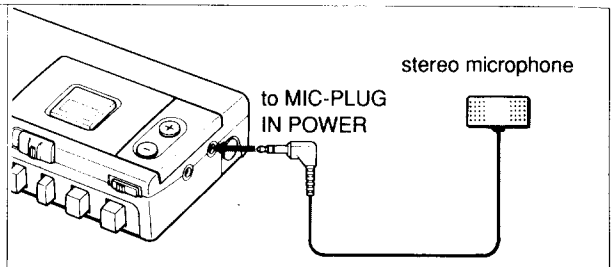
Resetting is completed and the tape counter is displayed.

Recording

For recording, first connect the stereo microphone or another recording source.

Connections for Recording with Microphone

Connect the stereo microphone to the MIC-PLUG IN POWER jack.

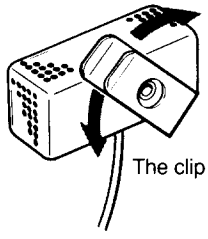


When connected, the power is supplied from the main unit (plug-in-power system).

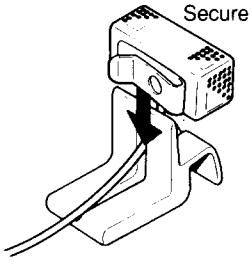
Do not place the stereo microphone too close to the main unit.

How to use the stereo microphone

You can attach the stereo microphone to your clothing (for example, for men, to their tie, for women, to their collar).



The microphone can also be set on the supplied microphone stand.



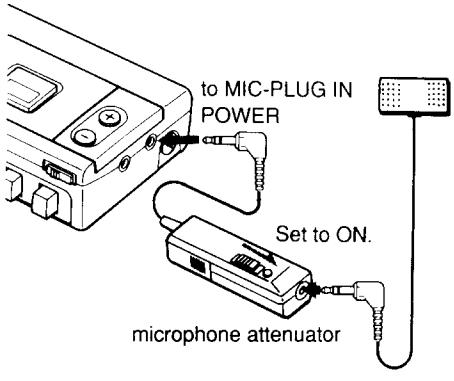
Optional microphones

You can use other commercially available Sony microphones. We suggest these:

- For better sound, stereo panoramic microphone ECM-909
- For interviews, tie-pin type stereo microphone ECM-121

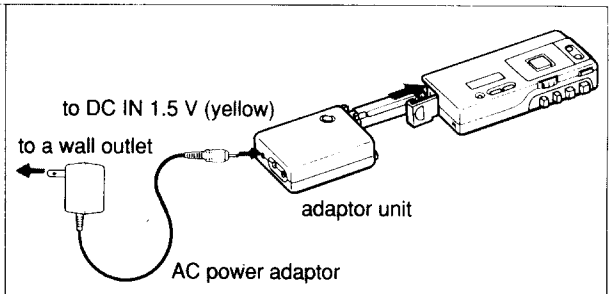
How to use the microphone attenuator

When recording with a microphone, the tape may sound distorted if the original sound source is too loud and/or too close. In such cases, connect the microphone to the microphone attenuator and set its switch to ON.

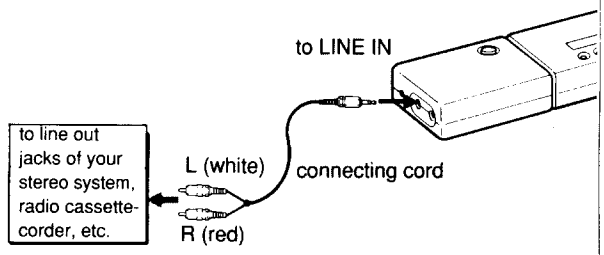


Connections for Recording from Other Equipment

1 Attach the adaptor unit and the AC power adaptor.



2 Connect the connecting cord to the LINE IN jack of this unit and the line out jacks of the additional equipment.



To monitor the sound being recorded

Connect the headphones to the PHONES jack, or connect the LINE OUT jack of this unit to the line in jacks of the monitoring equipment, using the connecting cord (see "Listening to a Tape", page 21).

If howling occurs

Howling noise may be heard while monitoring with a radio cassette-corder or other equipment. Set the REC MONITOR switch to OFF and use the headphones instead.
Normally set the REC MONITOR switch to ON.

For ease of operation with your stereo system

If you use your stereo system often as a recording source and/or monitoring device, we recommend that you leave the adaptor unit connected to your system. Just detach the main unit from the adaptor unit whenever you want to take the unit with you. This will save you the trouble of disconnecting and reconnecting the cords.

To connect to equipment with a stereo minijack-type line out jack

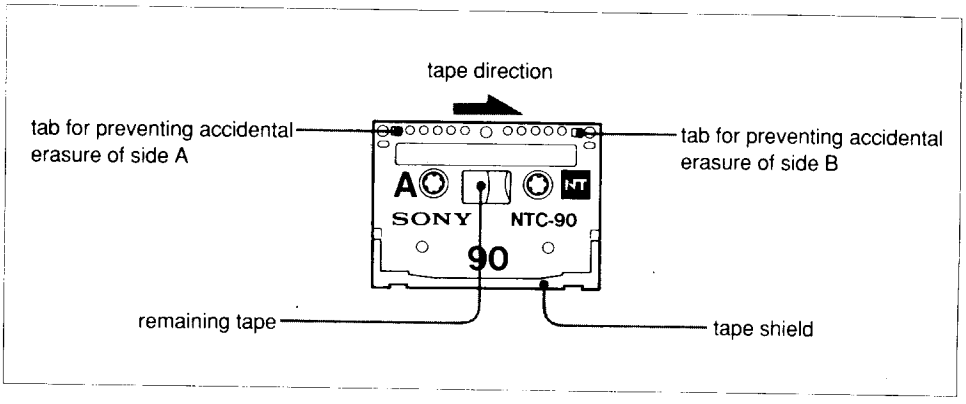
To record from equipment that has a stereo minijack-type line out jack, for example a Discman, you need a commercially available connecting cord (stereo miniplug to stereo miniplug). Connect the optional connecting cord to the line out jack of the additional equipment and the LINE IN jack of the adaptor unit on this recorder.

If you want to mix sound from two audio sources

Connect both the microphone and another piece of equipment (audio source) to the recorder. You can record the audio sound from both the microphone and from the other equipment.

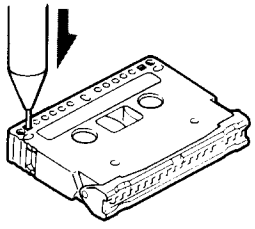
On the NT Cassette Tape

You can record on and play both sides of the NT cassette tape. The supplied NT cassette tape (NTC-90) offers you 90 minutes of recording and playing (45 minutes on each side).



To prevent accidental erasure

To prevent accidental erasure, the NT cassette tape has a red tab in the upper left corner of each side. When the red tab is not pushed in, you can record on that side; when it is pushed in, you cannot record. After recording, push in the tab fully with a pen tip to prevent accidental erasure. If you try to record with the tab pushed in, the "Err" lights in the display window and the unit stops automatically.
To reuse recording, push the tab out from the opposite side.



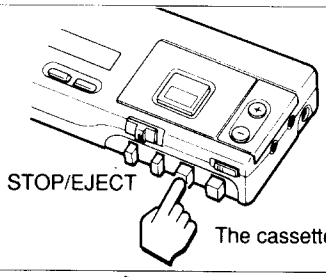
Note

The NT cassette tape has a tape shield to prevent dust from entering the tape. The tape shield opens and closes automatically when inserted and removed; therefore, do not force the tape shield open nor touch the tape inside.

Recording

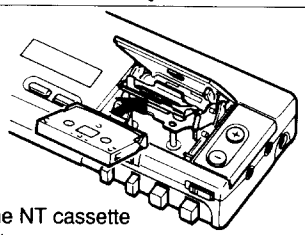
Follow the steps below for standard recording procedures. The recording level adjusts automatically (see "Digital AGC recording", page 18). If you need to adjust the recording level manually, follow the procedure for "Manual Recording" (page 20).

1 Press the STOP/EJECT button.



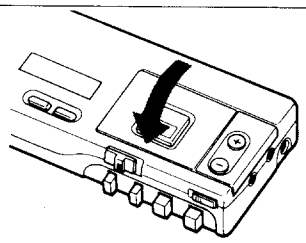
The cassette holder opens.

2 Insert the NT cassette tape with the side you want to record on facing you and with the tape shield facing into the machine.

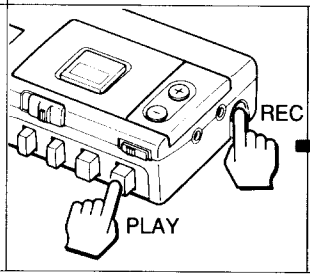


Slide in the NT cassette until it clicks.

3 Close the cassette holder.



4 Press and hold the REC button, then press the PLAY button.



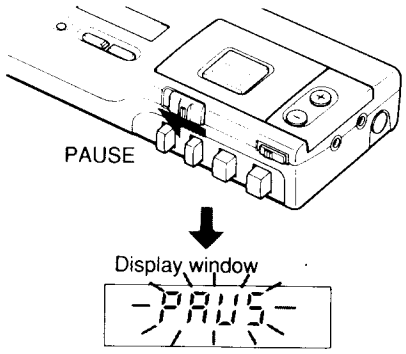
Display window

Recording starts. Press the COUNTER RESET button if necessary.

5 If you are recording from other equipment, play your recording source.

To stop recording
Press the STOP/EJECT button. The power will automatically shut off after about 5 seconds.

To suspend recording
Slide the PAUSE switch in the direction of the arrow.



"PAUS" and the tape counter alterate in the display window.

To resume recording, slide the PAUSE switch back to the original position.

To start recording precisely
Set the unit in pause mode and execute steps **4** and **5** on page 17. Start playing your recording source and release the PAUSE switch when you want to start recording.

To start recording midway through the tape
Play the tape to where you want to start recording. Then press and hold the REC button and slide the PAUSE switch to the left (recording pause mode).
Start playing the recording source and slide back the PAUSE switch when you want to start recording.

If you leave the unit in pause mode for more than 5 minutes
The unit automatically switches from pause mode to stop mode to protect the tape and heads from undue wear. (The PAUSE switch remains at the same position even after the unit switches to stop mode.)

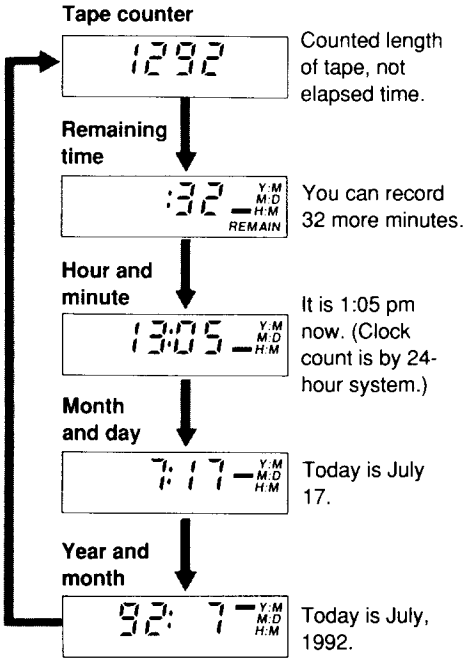
To record on the opposite side
Take out the cassette tape, turn it over and insert it again.

To make sure you have recorded everything
- When you want to stop recording, do not press the STOP/EJECT button right after the recording source has stopped playing, but a few seconds after.
- When you want to continue recording on a tape that has been partially recorded on, so as not to erase the end of the previous recording, slide the PAUSE switch to the left before starting to record again.

Digital AGC recording
The recording audio level is automatically adjusted by the digital AGC (Auto Gain Control) according to the level of the recording source. With digital AGC, sometimes the sound can be recorded a little unnaturally or with noise depending on the recording source and its changes in level during recording. In such cases, switch to manual recording (see page 20).

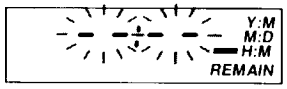
Display While Recording

Each time you pess the MODE button, the display changes (see the table below).
The display will change only during recording, fast-forwarding, rewinding or right after the unit has stopped.



Remaining time display

Playback mode determines how the remaining time is counted; therefore, it takes approximately 10 seconds after recording has started till the remaining time is displayed.
The display in the meantime is as illustrated below:



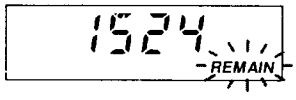
The displayed remaining time may differ a little from the actual time.

If the COUNTER RESET button is pressed

The display changes to the tape counter indicating "0000" regardless of the display before that.

When the remaining time of the tape is less than 4 minutes

The REMAIN indicator flashes in any mode of the display.



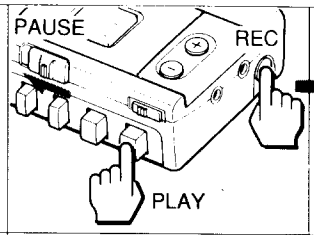
If the date and time display is flashing

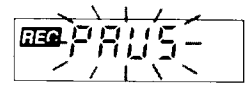
If the date and time is not set, the date and time display flashes when the MODE button is pressed. Note that while it is flashing, the recorded date and time is not being recorded. Make sure you insert a lithium battery and set the date and time before recording.

Manual Recording

We recommend you record using the digital AGC function, but in case you need to more precisely control the recording level, follow the steps below.

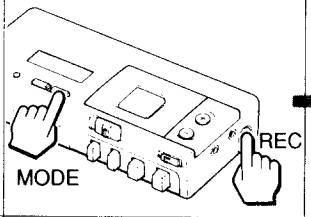
1 Slide the PAUSE switch in the direction of the arrow. Press and hold the REC button and press the PLAY button.

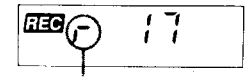




The unit is set to recording pause mode.

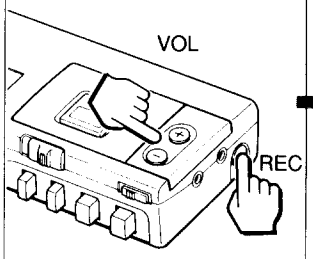
2 Press and hold the REC button and press the MODE button.

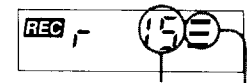




Indicates that the unit is in manual recording mode.

3 Press and hold the REC button and press the VOL + or - button to adjust the recording level.

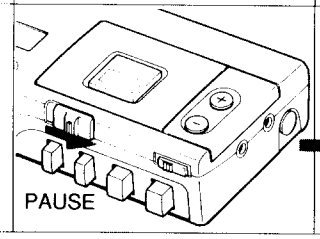




As the digits increment, the recording level increases (minimum:0, maximum:30).

Adjust the recording level so that the top bar lights once in a while.

4 Slide the PAUSE switch back to the original position.



Recording starts.

To switch to AGC recording

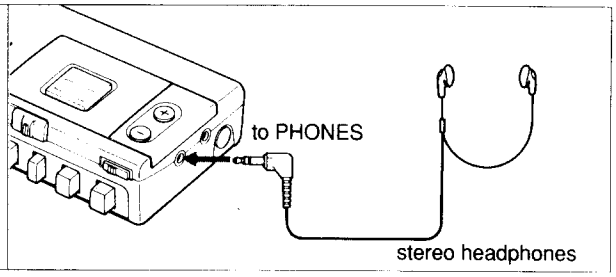
Press and hold the REC button. Then press the MODE button while recording manually. Also after the power shuts off, the unit automatically switches to AGC recording mode.

Listening to a Tape

Connect the headphones or other equipment such as a stereo system.

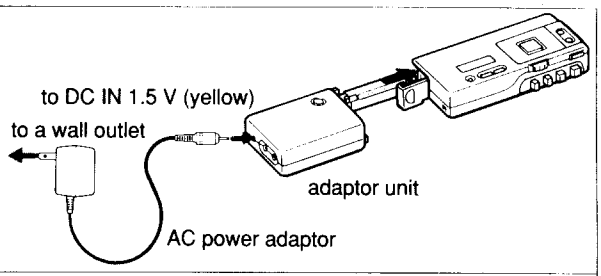
Connections for Listening through Headphones

Connect the headphones to the PHONES jack.

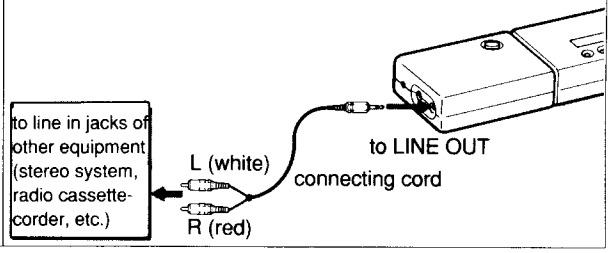


Connections for Listening with Other Equipment

1 Attach the adaptor unit and connect the AC power adaptor.



2 Connect the supplied connecting cord to the LINE OUT jack of this unit and the line in jacks of your equipment.

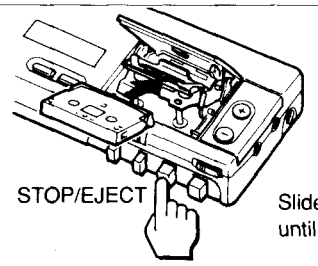


To listen to a tape in the car

Use the optional car battery cord (DCC-E115L) and the car connecting pack (CPA-3). Connect the car battery cord to the cigarette lighter and to the DC IN 1.5 V jack; connect the car connecting pack to the cassette deck of the car stereo and to the LINE OUT jack of the adaptor unit.

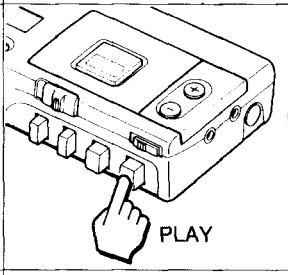
Playing a Tape

1 Open the cassette holder and insert the NT cassette tape with the side you want to listen to facing you and with the tape shield facing into the machine.



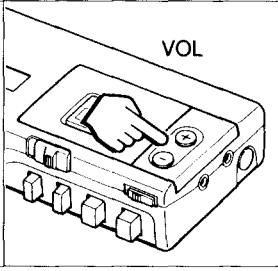
Slide in the NT cassette until it clicks.

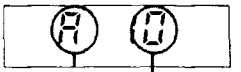
2 Close the cassette holder and press the PLAY button.



Playback starts.
Press COUNTER RESET if necessary.

3 Adjust the volume.
When the headphones are connected, press the VOL + or – button; when other equipment is connected, use the volume control of the connected equipment.





Indicates which side of the tape is now played.

As the digits increment, the volume increases (adjust between 01 and 30).

To stop playback

Press the STOP/EJECT button.
The power will shut off automatically after about 5 seconds.

To suspend playback

Slide the PAUSE switch to the left.
To resume playback, slide the switch to its original position.

To fast-forward and rewind

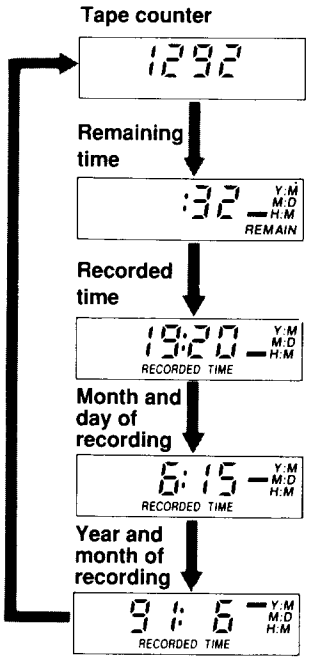
To fast-forward, press the FF button.
To rewind, press the REW button.

At the end of the tape

- When played or recorded to the end of the tape, "End" lights in the display window for a few seconds. The power shuts off and the PLAY button springs back automatically.
- When the tape is fully fast-forwarded or rewound, "End" lights up for a few seconds. The power shuts off automatically but the FF or REW button does not spring back. Press the STOP/EJECT button to restore the FF or REW button before operating the unit any further.

Display While Playing

The time and date when the recording was made can be displayed during playback. The display changes (see the following table) each time the MODE button is pressed (see page 19 for the display during recording, fast-forwarding, rewinding, and right after the unit has stopped):



If the COUNTER RESET button is pressed

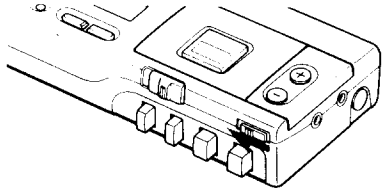
The display changes to the tape counter indicating "0000" regardless of the display before that.

When the remaining time of the tape is less than 4 minutes

The "REMAIN" flashes in any mode of the display.

To prevent undue wear of the battery

When you carry this unit, for example, in a bag or briefcase, slide the STOP MODE switch to the left to set the unit in hold mode. In hold, the unit cannot be operated even if a button accidentally is pressed.



STOP MODE

To release hold mode, slide the STOP MODE switch to its original position.

If the STOP MODE switch is set to HOLD during operation, it does not stop operation. However, once the unit is in the stop mode, the "HOLd" indicator flashes and the hold mode takes effect.

If the buttons are pressed during hold mode

- If the PLAY or REC button is pressed, "HOLd" flashes in the display window and the power shuts off automatically. "HOLd" disappears and the button pressed springs back.
- If the FF or REW button is pressed, "HOLd" flashes in the display window and the power shuts off automatically. "HOLd" disappears after a few seconds but the button pressed does not spring back.
  In this case, press the STOP/EJECT button to make the pressed button spring back before releasing hold mode.

Cautions

Notes on Headphones

Road safety

Do not use headphones while driving, cycling, or operating any motorized vehicle. It may create a traffic hazard and is illegal in some areas. It can also be potentially dangerous to play your headsets at high volume while walking, especially at pedestrian crossings. You should exercise extreme caution or discontinue use in potentially hazardous situations.

Preventing hearing damage

Avoid using headphones at high volume. Hearing experts advise against continuous, loud and extended play. If you experience a ringing in your ears, reduce the volume or discontinue use.

Caring for others

Keep the volume at a moderate level. This will allow you to hear outside sounds and to be considerate of people around you.

Do not take off the ear pads attached to the headphones. Without them, the headphones may be damaged.

On Installation

Do not install the unit in a location near heat sources such as radiators or air ducts, or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.

On Handling

Do not drop or hit the unit. Doing so may cause a malfunction in the unit.

On Battery

Incorrect battery usage may lead to leakage of battery fluid or bursting batteries. To prevent such accidents, observe the following precautions:

- Install the + and - poles of the batteries correctly.
- Do not try to recharge the batteries.
- When the unit is not to be used for a long time, be sure to remove the batteries.
- If a battery leak should develop, carefully and thoroughly wipe away battery fluid from the battery compartment before inserting a new one.
- Batteries and metal should not be put together. If the + and – poles of the batteries are connected to metal, a short circuit may result.

On Volume Control

Turn the volume down before playing back a tape.

The NT cassette tape offers you very clear sound with very little noise compared to usual cassette tapes. If you adjust the volume while listening to a blank part of the tape, the connected speakers, also your ears may be hurt by the sudden loud sound when the recorder encounters recorded signal.

When you have to adjust the volume without hearing the sound, press the MODE button and display the tape counter, so that you can control the volume looking at the volume level indicator in the display.

On Moisture Condensation

If the unit is brought directly from a cold to a warm location, moisture may condense inside the unit. In this condition, the tape may adhere to the head drum and be damaged, or the unit may not operate correctly. Always remove the cassette when the unit is not to be used.

Maintenance

Cleaning the Tape Head

Prolonged operation will cause contamination of the tape head. To result in the best possible recording and playback, we recommend cleaning the tape head periodically, using the Sony NTC-10CL cleaning cassette (not supplied).

How to use the cleaning cassette

1 Insert the cleaning cassette as you would an NT cassette.
2 Press the PLAY button. Press the STOP/EJECT button after about 10 seconds.
3 Remove the cleaning cassette without rewinding it.

Proceed with recording and playback with a normal NT cassette tape to check the sound quality.

Notes on the cleaning cassette

- The cleaning cassette cannot be used for recording and playback.
- Do not clean the tape head with the cleaning cassette more than five times over a short period of time.
  Cleaning the tape head continuously for too long a period of time may cause wear to the tape head.
- Do not rewind the cleaning cassette each time you use it. When the cleaning cassette tape is taken up completely, turn it over and use it on the opposite side.

Cleaning the cabinet

Clean the cabinet, panels, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

Specifications

Format	NT format
Tape	Digital micro tape (NT cassette tape)
Recording system	Helical scan 2 heads, digital recording
Recording head	3 heads
Recording time	90 minutes (supplied NTC-90)
Tape speed	Approx. 6.35 mm/s
Drum rotation	3000 rpm
Error correction	Cross-interleaving code
Track pitch	Approx. 9.8 µm
Sampling frequency	32 kHz
Modulation system	LDM-2
Number of channels	2-channel, stereo
Quantization	12-bit non-linear (equivalent to 17 bits)
Frequency response	10 Hz – 14,500 Hz (+1, –3dB)
Signal-to-noise ratio	More than 80 dB (1 kHz, IHF-A, 20 kHz LPF, LINE IN)
Dynamic range	More than 80 dB (1 kHz, IHF-A, 20 kHz LPF, LINE IN)
Total harmonic distortion	Less than 0.08 %
Wow and flutter	Below measurable limit (less than 0.001% W.PEAK)

NT cassette tape specifications

Size	30 x 21.5 x 5 mm (w × h × d) (1 3/16 × 7/8 × 7/32 inches)
Weight	2.3 g (0.08 oz)
Width	2.5 mm
Material	Metal evaporated tape
Maximum recording time	120 minutes (double side)

Input

	Jack type	Rated input level	Minimum input level
MIC	stereo minijack	1.38 mV	0.55 mV
LINE IN	stereo minijack	160 mV	64 mV

Output

	Jack type	Rated output level	Maximum output level	Load impedance
HEAD-PHONES	stereo minijack	–	5 mW + 5 mW	16 ohms
LINE OUT	stereo minijack	160 mV	–	47 kohms

General

Power requirements	DC 1.5 V size AA (R6) battery or AC power adaptor
Battery life	Approx. 7 hours (consecutive recording) Approx. 6 hours (consecutive playback) (Sony alkaline battery AM3)
Lithium battery life	Approx. 1 year
Power consumption	Approx. 300 mW
Dimensions	112.9 × 23.1 × 55.2 mm (w/h/d) (4½ × 15/16 × 2¼ inches) including projecting parts
Weight	147g (5.2 oz) (including battery)

Supplied accessories

Adaptor unit (1)
Lithium battery CR1220 (1)
AC power adaptor (1)
Connecting cord (pinplug × 2–stereo miniplug, stereo for line inputs and outputs) (2)
Stereo microphone (1)
Microphone stand (1)
Microphone attenuator (1)
NT cassette tape NTC-90
Stereo headphones (1)
Carrying case (1)

Note

This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

Design and specifications subject to change without notice.

Commercially available accessories

NT cassette tape (not recorded)
  NTC-60 (60 minutes)
  NTC-90 (90 minutes)
  NTC-120 (120 minutes, available in fall 1992)
Stereo panoramic microphone ECM-909
Tie-pin type stereo microphone ECM-121
Car battery cord DCC-E115L
Car connecting pack CPA-3
Active speakers SRS-58
Cleaning cassette NTC-10CL

Your dealer may not handle some of the above listed accessories. Please ask the dealer for detailed information how to order these accessories from Sony.

Troubleshooting Guide

Symptom	Cause and remedy (Refer to the pages indicated in ●)
The lithium battery lid cannot be opened.	• Turn the lid fully toward the CLOSE position; then press and hold PUSH and turn the lid to OPEN. ⑨
The cassette holder cannot be closed.	• The cassette tape is not inserted properly. ⑰
The unit does not work though a certain button is pressed. The tape does not move.	• The battery is weak. ⑩ • The power source is connected incorrectly. ⑪ • The PAUSE switch is slid to the left. ⑱ • The tape is wound completely. → Turn it over, or rewind. ㉒ • The STOP MODE switch is set to HOLD. ㉓ • The FF or REW switch is pressed. ㉒
Recording cannot be done.	• Connection is incorrect. ⑮ • Recording level is set at minimum (when recording manually). ⑳ • The red tab on the cassette tape preventing accidental erasure is pushed in. ⑯
You cannot monitor the sound while recording, though the connecting cord is connected to LINE OUT jack.	• The REC MONITOR switch is set to OFF. ⑮
Sound is not heard at all.	• Connection is incorrect. ㉑ • The volume is set at minimum. ㉒
Increase of noise or deterioration of sound.	• The unit is placed near noise sources such as a TV. → Place the unit away from noise sources. ㉔ • The tape head is not clean.→ Clean the head using the cleaning tape. ㉕
The clock does not keep good time.	• The lithium battery is weak. → Replace it with a new one. ⑨
The date and time is not recorded on the tape.	• The date and time has not been set. → Set the date and time. ⑲

Printed in Japan